

Artificial Intelligence (AI) Match Solution

Intelligent Match

- ◆ Matching solution backed by AI techniques match **requirements (criteria) v/s products, services or contents** (like electronic gadgets, cars, resumes, customer profiles etc.) intelligently. It also matches product/content v/s products/contents to get similar products/contents, etc.
- ◆ It gives the best to least matching results.
- ◆ It helps to find out cluster having homogenous (logically similar) products/contents/profiles based on input specification (or product/profile)

Abstract Matching

Match type is more at **abstract** and **conceptual level** rather than match based on exact feature (attribute/parameter) value-to-value or database query matching.

Restricted to Relaxed Search

User has option to select from **restricted search** to **relaxed search** and vice-a-versa. Search results can be restricted to top 5, 10 etc. or based % matching and cutoffs. Also user has option to select importance (weights) and matching options for each feature based on requirement or to refine the results.

Top Down Approach

Search proceeds in more **top down approach** guiding and leading user step-by-step what she/he is looking for, in more expert way (i.e. invoking only relevant inputs, avoiding contradictory and irrelevant features) rather than just horizontal search (where each parameter is treated at equal level). At any given point user has option to see matching results.

Decision Rules

Decision makers can add decision and business rules to filter, cross-check and validate the information. Rules can be added to give recommendations.

Self-learning and Adaptive

It can be configured to be **self-learning** and **adaptive**. It can learn from user features selection and weights used while selecting a product or contents etc. It can keep track of sessions, thereby understanding users' evaluation patterns.

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Comparing Database Match v/s AI-based Match

Database Match	Artificial Intelligence Match
Keyword Match Type	
<p>Exact keyword match: All matching parameters are matched exactly with contents or products</p> <p>E.g. If you are searching students whose qualification is B.E.(IT), the database match would return resumes where qualification is exactly B.E.(IT). It may return result <i>no match found</i> if there are no candidates with B.E.(IT) in database.</p> <p>If you are searching for digital camera whose one of the parameters is resolution, say 3.2 mega pixels and above. Database search will not show cameras, which with 3.0 mega pixels even if other parameters are all well matching.</p>	<p>Best nearest conceptual and logical match: All parameters are approximately (<i>fuzzy</i>) matched giving the best of all matching solution. There are various functions exist to compare feature values based on compare logic.</p> <p>e.g. If there is no student having qualification B.E.(IT). The AI would return results with B.Tech.(IT) or B.E.(CS) etc.</p> <p>AI search will show all cameras matching with user's other criteria around with resolution 3.2 mega pixels.</p>
Relaxed V/S Restricted Search	
<p>Database match returns <i>too many results</i> (sometimes get in 1000s, making it difficult task for users) when <i>only few search parameters</i> are selected. It returns all matching results. Restricting the results explicitly may lose some good matching products and contents.</p> <p>However, if <i>more matching parameters</i> are selected, sometimes it may result in <i>too few</i> or <i>no results</i> (i.e. Product with combinations of feature may not exist.).</p>	<p>AI match returns best approximate results based on few parameters. It shows results from <i>most matching to least matching</i> so results can be restricted to top 10 or 100 etc. AI match can be configured at run-time to select match restrictions and weights for each selected parameter to refine the results.</p> <p>More selected search parameters return <i>best matching results</i>. You may get products or contents with best of all features. Therefore can be used to search products or contents similar to a given product or content.</p>
Input Criteria Specification	
<p>Input criteria are normally form based and pre-programmed. Once the parameters and their values are selected, a database query is build and executed in pre-programmed manner.</p> <p>All parameters are at same level and have equal importance. It does not allow user to set importance and matching option (e.g. exact, almost, mostly etc.) for each parameter.</p>	<p>It is rule-based and modular invoking only relevant inputs/forms and, asking only relevant information. Criteria parameters can be easily added and removed. The queries are external, dynamic and can be modified easily.</p> <p>It allows user to set weight (importance) and option type for each parameter.</p>

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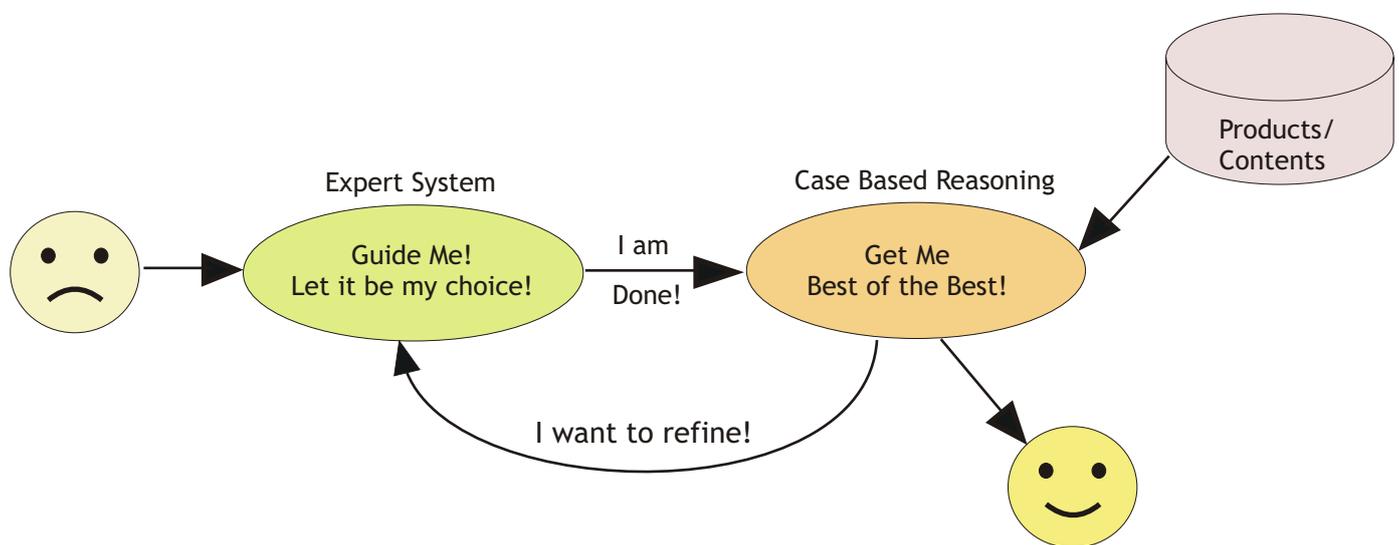
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Database Match	Artificial Intelligence Match
Search Approach	
<p>Horizontal search approach: Parameters used to match user's requirements works in horizontal fashion and at same level.</p> <p>e.g. Get me people who are B.E.(CS) and Experience greater than 3 years and staying in Mumbai. Database would return result combining all these three parameters in single filter (in the form - parameter1=value1 AND parameter2 =value2 AND ... ParameterN=valueN)</p> <p>Sometimes, matching parameter values are mutually exclusive (i.e. contents/ products with given combination does not exist) hence result will be nil.</p> <p>e.g. Qualification B.E.(CS) and specialization in 'Electronics' is not a valid case, hence result will be nil.</p>	<p>Top down search approach: Matching can be guided intelligently asking only relevant parameters.</p> <p>e.g. If degree is MBA, AI would ask only specializations in MBA etc. rather than asking all specialization.</p> <p>Parameters are more conceptually broken.</p> <p>e.g. Qualification B.E.(CS) is broken as Degree is Bachelor Level, Discipline is Engineering and, Specialization is Computer Science.</p> <p>It is possible to refine results step-by-step.</p>
Application Analysis	
<p>It does not have learning and analysis capability.</p> <p>e.g. If users has to check any anomaly in resume by cross-checking data etc. then it is to be done by herself. The intelligence required is not provided in database management.</p>	<p>Since each user has given an option to set importance and matching in top-down approach, system can learn importance of parameters/features selected by user. In collaborative filtering two related values can automatically adjust their weights.</p> <p>Detailed decision rules can be added to cross check information provided by the user.</p> <p>e.g.</p> <p>[1] Birth-date + Qualification v/s Number of years of experience quoted. [2] Skills v/s Job profile</p> <p>This can help to remove the applications that are not consistent or somewhat fishy. This can reduce time spent by recruiters in analyzing applications.</p>

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iKen Match Solutions

- ✍ Developed on top of iKen Studio (so brings all features of iKen Studio): This AI is possible because **hybrid approach**. Matching solution uses combination of **expert system** and **case-based reasoning approach**.
- ✍ Expert system is used 1. to guide the user intelligently to understand what they are looking, 2. to invoke or ask only relevant and appropriate features, 3. to cross check and scan information provided by user etc. and 4. to coordinate and control the execution of case-based reasoning
- ✍ Case-based reasoning has been used 1. to intelligently match the user criteria with existing products and contents. 2. to learn important parameters, their importance in product/content selection 3. to learn associations between contents or values.



- ✍ No need to restructure database schemas, it can even work with information stored in spreadsheets. If database of products/contents etc. already exists, **solutions can be developed in a day or so**.
- ✍ Additional or new features can be easily added and modeled to existing ones without any coding or programming
- ✍ Large number of similarity functions provided to **model matching logic**.
- ✍ **Custom similarity functions** for matching logic can be added.
- ✍ Has all capabilities shown in the table above.